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BULLETIN
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The Genus Hicoria of Rafinesque.

BY N. L. BRITTON.

"*Scoria* (*tomentosa*, *mucronata*, *alba*, *pyriformis*, *globosa*, *&c.*) *Juglans alba* L., *tormentosa*, *mucronata*, Mich., &c. The hickory."

This is what Mr. Rafinesque is made to say in the Medical Repository, 2d hexade, Vol. v., p. 352, in the year 1808, under the title "Prospectus of two intended works on North American Botany."

Those who do not regard priority of publication as the all-important item in biological nomenclature will doubtless consider the facts and conclusions here presented as entirely uncalled for, and will object to them on the ground of unnecessary introduction of new binomials for very familiar plants. While regretting the fact that in proposing changes of this kind it is quite impossible to please everybody, I am also assured that a large number of botanists will cordially welcome any move to restore old names, inasmuch as this tends to bring nomenclature to a stable basis—a result worth much momentary inconvenience. I am thus encouraged in calling the attention of American botanists to Rafinesque's generic name for the hickories, and am persuaded to believe that the literary recognition thus awarded is only too long delayed.

The hickories are among the most characteristic elements of the existing North American flora, and together form a genus as marked in structure as it is in geographical distribution, being entirely confined to East America, with two species occurring in Mexico. For some reason the older botanists failed to recognize their generic validity. They, without exception, grouped the hickories with the real walnuts, regarding and describing all as species of *Juglans*. Rafinesque was the first to record an opinion that they form a distinct genus and the name he proposed this should bear must certainly stand. His opinion is now shared by all.

I do not know which of the old masters was the first to refer to these trees. Loudon says that the Eastern Shag-bark was introduced in English gardens in 1629. Parkinson states on page 1414 of his Theatrum Botanicum (1640), alluding to this tree as "*Nux Juglans alba Virginiensis,* the White Walnut of Virginia. The tree hereof groweth more upright and spreadeth lesse (he is comparing it with the real walnuts), the leaves are alike and the nut smaller, much thicker and whiter in the outer, hard shell than any of the former sort, and the kernel within much lesse also, but white and as sweete." Plukenet's Almagestrum Botanicum (1696) p. 264, indicates four kinds as known to him:

(1). *Nux Juglans Virginiana folius vulgaris similis, fructu subrotundo, cortice duriore lævi.* The Hickory or White Virginian Walnut. Haec est illa nux quam nostrates vocant the Hickery, seu Pick hickery Nut; cujus nucleis lac conficient, Indi quod vocant Hickery Milk. He refers to Parkinson's description above quoted. This description appears to have been applied to the Eastern Shag-bark.

(2). *Nux Juglans Virginiana alba minor, fructo nucis moschatæ simili, cortice glabro, summo fastigio veluti in aculeum producto.* He figures the nut on Plate 309, fig. 2, a and b, representing that of the Small-fruited Hickory.

(3). *Nux Juglans Virginiana alba, fructu parvo anguloso, cortice lævi.* Represented on the same plate, fig. 2, c, being a small nut of the Eastern Shag-bark.

(4). *Nux Juglans angulosa major, Americana, fructu longiore, cortice albo lævi, summo vertice mucronata.* He figures both the foliage and the nut of this species (figs. 2 and 2 d), guesses that it came from New England, and, although he says that the seed is very bitter, I can only associate it with the Balsam Hickory.

Miller's Gardener's Dictionary (1731) rcognized, however, only two of those described by Plukenet, still under *Nux Juglans,* remarking that "the Virginian sorts are preserved as rarities by such persons who are curious in collecting the several sorts of trees."

I shall now attempt to trace in outline the history of the introduction into botanical literature of the names which the species we are now able to differentiate must bear. In this I have freely availed myself of the cited synonymy of the genus, and especially of the exhaustive display of it given by Professor C. S. Sargent, in the Forestry Report of the Tenth Census, comparing the references I have had occasion to use, but without noticing a single discrepancy.

Linnæus carried Miller's process of eliminating Plukenet's species still farther, for he records but a single species, viz: *Juglans alba* (Species Plantarum, Ed. I., p. 997, (1753). While his description and synonyms indicated that he had several species confounded, his specimens are of the Woolly Hickory or Moker Nut, as is stated by all recent authorities, and which I can now confirm from a recent inspection of them; they consist of leaves and staminate catkins. It is quite remarkable that he was unable to separate more species, when we recall the large number of oaks, maples, ashes and other North American forest trees that he described. On one of these old herbarium sheets I was much interested to note the following memorandum written in pencil: "Hickery Nut, forte genus novum, capsula 4-valvis." J. E. S. I cannot find that Sir J. E. Smith ever published anything on the subject. This name was in common use for the Moker Nut up to the appearance of the last edition of Bigelow's Florula Bostoniensis (1840).

The seventh edition of Miller's Gardener's Dictionary, published in 1759, brought in two additional species, *Juglans glabra*, the Pig Nut, and *Juglans ovata*, the Eastern Shagbark.

Humphrey Marshall's "Arbustum Americanum" appeared in 1785. He applied trinomial appellations to most of the species, regarding all the true hickories as varieties of *Juglans alba*; indeed he defines no type of it. His *Juglans alba minima* has been referred to the Bitternut Hickory, and no doubt correctly so, although he calls it the Pig Nut, a name even yet applied to it in certain parts of the country. He names also *Juglans Pecan*, the Pecan Nut; the other forms described by him had already received names.

In 1796 the Western Shell-bark Hickory was described as

Juglans sulcata, by Wildenow, in his Berlinische Baumzucht, p. 154, together with several of the other species previously known.

In 1803, Michaux (Flor. Bor. Amer., ii., 192) divided *Juglans* into two sections, the one containing the real walnuts, the other the hickories, but he did not give them even sub-generic names, and described no species additional to those previously recorded.

The younger Michaux's Histoire des Arbres Forestiers de l'Amerique Septentrionale (1810), brought in *Juglans myristicæformis*, the Nutmeg Hickory, and *Juglans aquatica*, the Water Hickory.

We have now reached the time of Rafinesque, and his statement, given at the head of this article, is the first separation of the Hickories from the Walnuts, under a distinct name. Unfortunately the proof of his paper in the Medical Repository was not well read, and *Scoria* was printed for *Hicoria*. There need be no doubt of what was intended. Rafinesque says in his Florula Ludoviciana (1817), p. 109, " My name, *Hicorius*, long ago proposed, contains all the species of *Juglans*, which have trifid male flowers (instead of six-cleft), generally tetrandrous, and fruits with angular and quadrifid shells." He then characterizes two species, both of which were already known.

The next important phase in the history of the genus was the introduction of the generic name *Carya*, by Thomas Nuttall, in his Genera of North American Plants, published in 1818. Quite ignoring Rafinesque, he publishes the genus as containing species of *Juglans* of Linnæus and Willdenow, gives a list of nine species without their equivalents and with descriptions of three only, yet, inasmuch as many of his specimens are preserved, he is generally cited as author of the binomials. This injustice did not pass without a protest on the part of Rafinesque, for in the very next year he remarks as follows, in "Journal de Physique," &c., p. 260 (Vol. lxxxix., 1819): "*Hicorius*, Raf. Obs. Fl. Ludov., 1817, a été changé sans cause en *Carya*, N., nom posterieur radical et tres-mauvais." It is remarkable that he does not here refer to his publication in the Medical Repository nine years before. But the next statement that Rafinesque made, regarding the genus (Alsographia Americana, 1838, p. 65), makes evident what he had then intended. He says under the caption :

HICORIA OR HICKORY TREES.

"*Hicoria*, Raf., 1808. *Carya*, Nuttall, 1818, &c. As early as 1804 I proposed to separate the Hickories from the Walnuts, to which Muhlenberg objected. I did so in 1808, in my remarks on Michaux's Flora, and again in 1817, in my Florula Ludoviciana, giving the almost Grecian name of *Hicoria;* yet Nuttall changed it in 1818 (without mentioning my labor) into *Carya*, which merely means nut, and is as bad a name as that of *Nux*, given by Adanson to *Juglans* * * * ; some botanists have, however, adopted this bad name, but it is hoped will have no objection to my previous modification of it when they may know of my previous claim." Then follows a division of the genus into four sub-genera, under which species are mentioned without descriptions or equivalents. He also proposes three new species, all of which were previously known. It will be noticed that Rafinesque here refers to his remarks in 1808, on Michaux's Flora; these I have have hitherto been unable to find, unless he is alluding to the Medical Repository paper, which makes mention of Michaux's book, but his spelling of *Hicoria* in 1838, and reference to his former statements, leave no doubt of what he intended for the orthography of what the printer made *Scoria.* It is very strange that the misprint was never alluded to by the author.

In 1853 Major John LeConte described what he considered a new species of Pecan Nut, in the Proceedings of the Philadelphia Academy, of that year, p. 402. He remarks: "This species of *Hickorea*, which I found cultivated in Georgia, is a native of the State of Texas. * * * I have adopted Mr. Rafinesque's name *Hickorea* for the genus in preference to Mr. Nuttall's *Carya* on the ground of priority. Whatever may have been the errors or aberrations of Rafinesque, Nuttall was not justified in changing a name proposed by the former years before any publication of his own." He then describes *Hickorea Texana*, which Prof. Sargent has reduced to the common Pecan. I have not seen it.

In 1862, Casimir DeCandolle published a memoir on the Juglandeæ in Annales des Sciènces Naturales, (IV.), xviii., 33, where he described *Carya Texana* as a new species based on a specimen collected by Charles Wright in Eastern Texas, but in his subsequent monograph of the order for the Prodromus (Vol.

xvi., 2nd part, p. 145) he regards it as a doubtful species. This I have not seen.

The latest addition to the species is to be found in Hemsley's Botany of Central America, (Vol. iii., p. 162) published in 1883, where *Carya Mexicana*, Engelm., is described from Dr. Engelmann's manuscript, based on Parry and Palmer, No. 834½ from mountains near San Luis Potosi, at an altitude of 8,000 feet. After a careful examination of the materials preserved in the Philadelphia, Washington, Easton and New York Herbaria, I have not been able to reduce any of the species found in recent writings. I would, however, arrange them a little differently than has hitherto been done in order to bring out more natural alliances. It is a very perplexing genus, and I am not sure that any arrangement would be wholly satisfactory. The salient characters of one species are liable to appear in others, sometimes with considerable prominence, rendering it troublesome to refer certain individuals even when they are well known. Single herbarium specimens are, naturally, even more perplexing. My present notion of them is as follows:

(A.) Subgenus PACANIA, Raf., Alsogr. Amer., p. 65. Nut cylindical or oval, smooth, two-celled; staminate catkins in lateral, nearly sessile fascicles at the summit of shoots of the preceding year.

(1.) H. PECAN (Marsh.) (*Juglans Pecan*, Marsh., Arb. Amer., p. 69; (1785); *Juglans olivæformis*, Michx., Fl. Bor. Amer., ii., 192; (1803); *Carya olivæformis*, Nutt.)

(1a.) *H. Texana*, LeConte, Proc. Phila. Acad., 1853, p. 402. I am not at all satisfied that this can certainly be referred to the ordinary Pecan. There appear to be no specimens extant to illustrate the description, but the characters given would indicate that this may very well be a different species or variety, and this supposition is strengthened by the statement that the leaves of the Pecan are fully formed before those of the tree in question show the least sign of unfolding.

(B.) Subgenus EUHICORIA. Nut more or less compressed (except in the last species), ovate, obovate, oval, or nearly globular; staminate catkins in threes on a common peduncle at the bases of shoots of the season.

*Involucre of the fruit very thick, splitting freely nearly or quite to the base; middle lobe of the staminate calyx at least twice as long as the two lateral broader ones; seed sweet and delicious; nut ridged and angular.

†Leaflets 5; bark shaggy.

(2.) H. OVATA (Mill). (*Juglans ovata*, Mill., Gard. Dict., No. 6, (1759); *Juglans alba*, Michx., Flor. Bor. Amer., ii., 193, (1803), not Linnæus; *Carya alba*, Nutt.)

(3.) H. MEXICANA (Engelm.) *Carya Mexicana*, Engelm., in Hemsley, Bot. Cent. Amer., iii.. 162). This I place here provisionally, suspecting it to belong to this group, but staminate catkins have not been described.

† †Leaflets 7 to 9; (rarely, some leaves produce 5.)

‡Bark close, foliage very pubescent and odorous.

(4.) H. ALBA (L.). *Juglans alba*, L., Sp. Plant., p. 997, (1753); *Juglans tomentosa*, Lam., Encyc. Meth., iv., 504, (1797); *Carya tomentosa*, Nutt. Dr. Torrey has described a var. *integrifolia* of this species in Bot. New York, ii., p. 182, t. 100, characterized as having nearly entire leaflets and smaller fruit. I have not seen any specimens with as entire leaflets as those figured.

Var. MAXIMA, (Nutt.). (*Carya alba*, Nutt., var. *maxima*, Nutt., Genera. ii., 221, has fruit twice the ordinary size. Rafinesque called it *H. maxima*. (Alsog., l. c.)

‡ ‡Bark shaggy; foliage puberulent.

(5.) H. SULCATA, (Willd.). *Juglans sulcata*, Willd.,* Berl. Baumzucht, p. 154, t. 7, 1796; *Carya sulcata*, Nutt. Besides the eastern stations reported for this tree we can add from Professor Porter's Herbarium, Alexandria, Huntingdon County, and Sellersville, Bucks County, Penn.

* *Involucre of the fruit thin, not splitting freely to the base; lobes † of the staminate calyx nearly equal in length, the lateral ones broader; bark close.

†Nut compressed-globular, or compressed-pyriform, smooth or slightly ridged.

‡Nut small, thin-shelled; leaflets 5 to 7, smooth.

(6.) H. MICROCARPA (Nutt.) *Carya microcarpa*, Nutt., Genera, ii., p. 221.) This must be regarded as a very critical species; excepting its thinner-shelled, generally smaller nut, I have been entirely unable to distinguish characters which will always separate it from the next. Professor Sargent has united it with the Eastern Shagbark, referring to it in the Forestry Report of the 10th Census, p. 133, as "a form with small, thin shelled nuts." I am very confident that its alliance is not with *H. ovata.* The mistake may have arisen from the fact that in the Herbarium of the Philadelphia Academy, a label of Nuttall's has been misplaced and pasted alongside of a flowering twig of *H. ovata.* But his original description, his authentic fruiting specimens both at Philadelphia and Kew, and the figure of the plant in his Sylva, prove that its affinities are not with the Shagbarks, but rather as I have placed it.

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*Casimir DeCandolle cites Duhamel as author of this name, but I have not been able to find it in his writings. If he did describe the tree it was probably before Willdenow's book was published.

†In *H. microcarpa* the middle lobe is sometimes considerably longer than the lateral ones.

‡ ‡Nut larger, thick-shelled ; leaflets 5 to 9.

(7.) H. GLABRA (Mill). (*Juglans glabra*, Mill., Gard. Dict., No. 5, (1759); *Juglans porcina*, Michx. f., Hist. Arbres Amer., i., 206, t. 9, (1810); *Carya glabra*, Torr.; *Carya porcina*, Nutt.) The size of the nut is given in Gray's Manual. (p. 449), at from 1½ to 2 inches long. While they do actually grow as large as this in the Southern States, the more correct figures for those of New York and the Middle States generally is not more than half these dimensions.

‡ ‡ ‡Nut smooth, very thin-shelled, with a very bitter seed ; leaflets 7 to 9, ovate lanceolate, minutely glandular, pubescent beneath.

(8.). H. MINIMA (Marsh). *Juglans alba minima*, Marsh., Arb. Amer., p. 68, (1785); *Juglans amara*, Michx., f., Hist. Arbres Amer., i., 177, t. 4, (1810); *Carya amara*, Nutt.) The name *minima* applied by Marshall evidently refers to the size of the leaflets, which, as a general thing, are smaller at maturity than those of any other Northern species.

‡ ‡ ‡ ‡Nut thin-shelled, angular ; seed bitter ; leaflets 7 to 13, lanceolate-acuminate, somewhat falcate and inequilateral, slightly pubescent below.

(9.) H. AQUATICA, (Michx., f.) (*Juglans aquatica*, Michx., f., Hist. Arbres Amer., i., 182, t. 5 ; *Carya aquatica*, Nutt.) The northward range of this species may now be increased to Mob Jack Bay, Virginia, (Leggett.)

† †Nut ovoid, smooth, extremely thick-shelled.

(10.) H. MYRISTICÆFORMIS, (Michx., f.) *Juglans myristi-*

cæformis, Michx., f., Hist. Arbres Amer., i., 211, t. 10; *Carya myristicæformis*, Nutt.)

With *Carya Texana*, C. DC., Ann. Sci. Nat. (IV), xviii., 33, I am entirely unacquainted.

The Herbaria are not without indications of additional forms to those I have been able to separate. Noteworthy among these is a specimen collected by Mr. Curtiss at Lookout Mountain, Tenn., and preserved in the National Herbarium. It is in fruit, and belongs, I suspect, to the group with thin husks. The fruit is oblong, an inch in length and strongly four-winged by the projecting edges of the involucre valves. The leaflets are uniformly seven, ovate-lanceolate, acuminate, and remarkably pale beneath, in which character it differs from all the species I know. There is a slight amount of pubescence on the rachis and midveins.

In the mountains of Sussex County, New Jersey, there occurs a form of *H. glabra*, which has more or less pubescence on the lower surfaces of the leaves, and particularly on the rachis at the base of the leaflets.

Bibliographical Notes on well known Plants.—IX.

BY EDWARD L. GREENE.

UNIFOLIUM.

I have recently, in a single short paragraph,* called attention to this, that neither the name *Smilacina*, which still holds place in our American books, nor *Tovaria*, adopted by Mr. Baker in his late comprehensive revision of the genus, is the lawful generic name of our stellate-flowered kinds of Solomon's Seal.

In the paragraph alluded to I suggested that *Polygonastrum*, Moench, must be older than *Smilacina*, Desf., and so it is; yet even Moench's name is three years later than *Tovaria*, Necker. Dr. Gray, who took exception to the use of *Tovaria* here, did so on the ground that, long before Necker, Adanson had framed the name *Tovara* for a certain ambiguous Polygonaceous type. But that which must more positively and indeed quite unquestionably displace *Tovaria*, as well as *Smilacina*, is the fact that Adanson himself recognized the genus and gave it the name *Vagnera*; so that this is older than *Tovaria* by twenty-seven

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*Pittonia, i., 187.